

# Efficient generation and tailoring of rotational SRS spectra generated in hydrogen-filled hollow-core photonic crystal fibre

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We report on the generation of a rich, purely rotational spectrum of 8 SRS bands (see Figure) with an extremely low (80nJ) energy threshold in an 11-m-long hydrogen-filled hollow-core photonic crystal fibre. The temporal behavior of the SRS process is also examined for different interaction timescales in this new regime of very long interaction lengths - achievable because of the low transmission loss in the fibre. Transient SRS is experimentally observed for pulses as long as 15ns. A theoretical model corroborating our experimental results is given

Furthermore, tailoring of the SRS spectral components (suppression and/or enhancement of Raman bands) using the unique transmission properties of the hollow-core PCF is demonstrated [1].

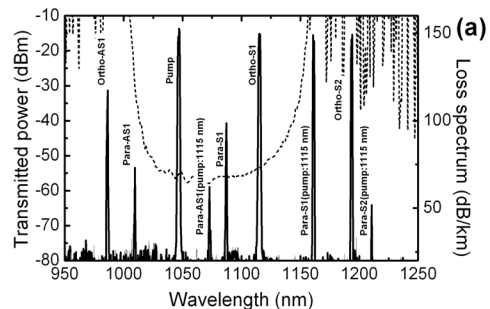


Figure. The SRS spectrum emerging from the hydrogen filled hollow-core PCF pumped at 1047nm. The peaks correspond to various rotational Raman peaks. In the background the loss spectrum of the fiber is also shown.

[1] F. Benabid et al, Phys. Rev. Lett. 93 123903 (2004)